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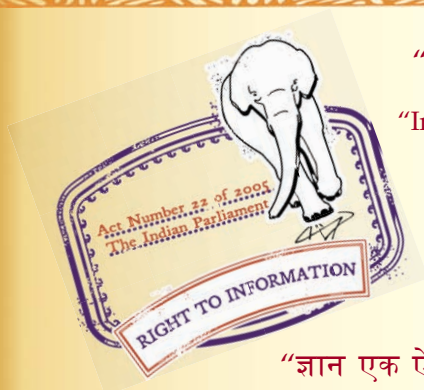
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IS 3793 (1966): Live Centres [PGD 2: Machine Tool Elements and Holding Devices]



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“Knowledge is such a treasure which cannot be stolen”

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(Reaffirmed 1998)

Indian Standard

**SPECIFICATION FOR
LIVE CENTRES**

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR LIVE CENTRES

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SPECIFICATION FOR LIVE CENTRES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 15 November 1966, after the draft finalized by the Machine Tools Sectional Committee had been approved by the Mechanical Engineering Division Council.

0.2 Live centres are normally used on lathes for holding and rotating jobs between the centres. In addition to lathes, live centres are also used in other similar types of machines.

0.3 In the preparation of this standard, assistance has been derived from the following standards:

JIS B 6158-1961 Live centres. Japanese Standards Association.

PN-62/M-60611 Przyrządy i uchwyty Kły tokarskie obrotowe.
(Implements and chucks : 60° Lathe live centres). Polski Komitet
Normalizacyjny.

0.4 The following standards are necessary adjuncts to this standard:

*IS : 1715-1963 Dimensions for self-holding tapers

IS : 2289-1963 60° Dead centres for lathes

IS : 2534-1963 Carbide tipped dead centres

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements of live centres of precision and standard grades of accuracy.

*Since revised.

†Rules for rounding off numerical values (*revised*).

2. MATERIAL AND HARDNESS

2.1 Material

2.1.1 The material for the manufacture of taper shank with the body shall be carbon steel of a suitable quality with a minimum tensile strength of 60 kgf/mm².

2.1.2 The centre shall be made of a suitable quality tool steel.

2.2 Hardness

2.2.1 The taper shank shall be heat-treated to a hardness of 32 to 40 HRC.

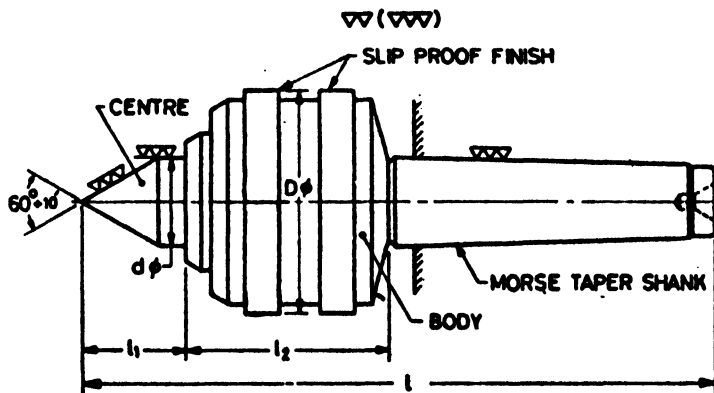
2.2.2 The tip of the centres shall be heat-treated to a hardness of 60 to 63 HRC.

3. DIMENSIONS

3.1 The dimensions for different sizes of live centres shall be as shown in Table 1.

TABLE 1 DIMENSIONS FOR LIVE CENTRES

All dimensions in millimetres.



TAPER	<i>d</i> Min	<i>D</i> Max	<i>l</i> ₁ ± 1	<i>l</i> ₂ Max	<i>l</i> Approx
Morse 1	12	35	20	42	120
Morse 2	18	45	24	45	140
Morse 3	24	60	28	56	170
Morse 4	28	70	36	75	220
Morse 5	36	75	40	80	255
Morse 6	56	100	56	90	335

3.1.1 Taper shanks shall have Morse taper in accordance with IS : 1715-1963*.

3.2 The tolerances on dimensions, where they have not been specified in this standard, shall be according to the fine grade specified in IS : 2102-1962†.

3.3 The figure is intended only to illustrate the dimensions and not to indicate the details of design.

4. DESIGNATION

4.1 Live centre shall be designated by the commonly used name with grade of accuracy, size of Morse taper and number of this standard.

Example:

A live centre of precision grade with Morse 4 taper shall be designated as:

Live Centre, Precision, Morse 4 IS : 3793

5. ACCURACY OF LIVE CENTRE

5.1 The accuracy of live centre is determined by the axial play, the radial run out and the alignment of centre with the taper shank.

5.2 Accuracies of two grades of live centres shall be as shown in Table 2. The arrangement for testing radial run out and alignment of centre with the taper shank shall be as shown in Fig. 1 and 2.

TABLE 2 ACCURACIES OF LIVE CENTRES

All dimensions in millimetres.

GRADE OF ACCURACY	AXIAL PLAY	RADIAL RUN- OUT OF CENTRE	ALIGNMENT OF CENTRE WITH TAPER SHANK	TOLERANCE ON ANGLE OF CENTRES
	<i>Max</i>	<i>Max</i>	<i>Max</i>	<i>Max</i>
Precision	0.02	0.008	0.01	+ 10 minutes
Standard	0.02	0.015	0.02	+ 10 minutes

6. MARKING

6.1 The live centre shall be marked with the name or registered trade-mark of the manufacturer, size of Morse taper and grade of accuracy.

*Dimensions for self-holding tapers (Since revised).

†Recommendations for machining deviations for dimensions without specified tolerances (Since revised).

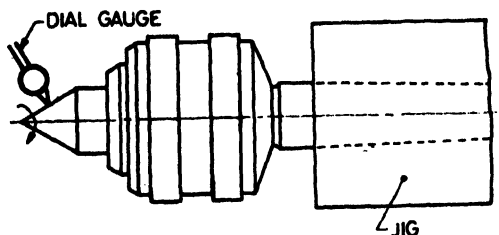


FIG. 1 ARRANGEMENT FOR TESTING RADIAL RUN-OUT OF CENTRE

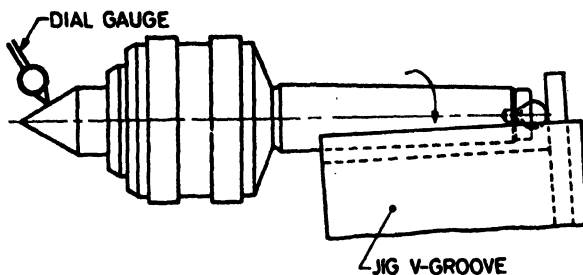


FIG. 2 ARRANGEMENT FOR TESTING ALIGNMENT OF CENTRE WITH TAPER SHANK

6.1.1 The product may also be marked with Standard mark.

6.1.2 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7. PACKING

7.1 The live centres shall be wrapped with moisture-proof paper and shall be packed in accordance with the best trade practice.

8. TESTS

8.1 **Accuracy Test** — The accuracy test shall be carried out in accordance with the requirements as specified in 5.2.

8.2 **Running Test** — The mandrel is rotated and cross-wise load as given in Table 3 is applied as shown in Fig. 3. The running test should be

conducted for a period of 5 to 10 minutes and could be carried out either on a lathe or any other device. At the end of the test, the centre shall be able to rotate freely.

8.2.1 The sampling plan for this test should be agreed to between the manufacturer and the purchaser.

TABLE 3 CROSS-WISE LOAD ON MANDREL HELD BY LIVE CENTRE

(Clause 8.2)

TAPER	SPEED	Cross-Wise Load
	rev/min	kgf
Morse 1	1 120	40
Morse 2	1 120	120
Morse 3	1 120	160
Morse 4	1 120	320
Morse 5	1 120	390
Morse 6	710	1 200

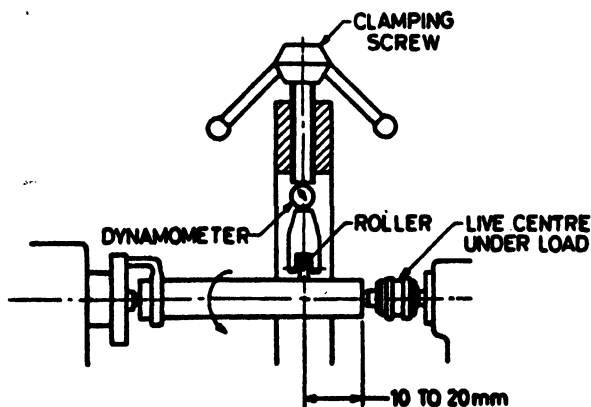
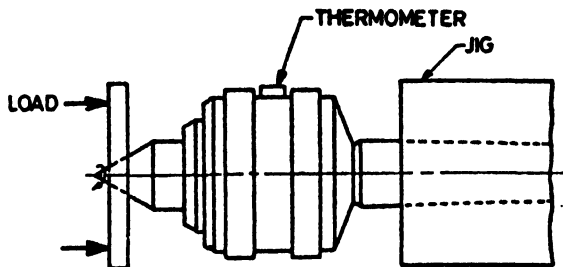


FIG. 3 ARRANGEMENT FOR RUNNING TEST

8.3 Temperature-Rise Test — The live centre is rotated at a speed and axial load as given in Table 4 and shown in Fig. 4. The rise in temperature recorded after 30 minutes running shall not exceed 50°C.

TABLE 4 AXIAL LOAD AND SPEED FOR TEMPERATURE TEST*(Clause 8.3)*

TAPER	SPEED (APPROXIMATE) rev/min	AXIAL LOAD kgf
Morse 2	1 440	25
Morse 3	1 440	35
Morse 4	1 440	50
Morse 5	1 000	50
Morse 6	1 000	100

**FIG. 4 ARRANGEMENT FOR TEMPERATURE-RISE TEST**

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